REMARKS

Claims 1-5 are all the claims pending in the application. Claims 1-5 have been rejected under 35 U.S.C. § 112, second paragraph, and claims 1-5 have been further rejected under 35 U.S.C. § 102.

As a preliminary matter, the Examiner objects to the drawings due to minor informalities. Specifically, the Examiner states that Figures 1A-22 are not labeled as required by 37 C.F.R. § 1.83(a). As shown in the attached Request for Approval of Proposed Drawing Corrections, Applicant has amended the figures according to the Examiner's suggestions in order to overcome the objections. Accordingly, Applicant respectfully requests withdrawal of the objections to the drawings.

Also, Applicant has made minor editorial amendments to the Abstract so that it conforms to MPEP § 608.01(b) guidelines.

Turning to the art rejections, the Examiner has rejected claims 1-5 under 35 U.S.C. § 112, 2nd paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. Specifically, the Examiner states that the claims fail to provide any layers or structural relationship, that it is unclear which layers are defined and that the specified layer does not specify the material being used. However, Applicant respectfully disagrees with the Examiner. Each limitation in the claims has a proper antecedent basis. In addition, each element of the claims is fully disclosed in the specification and drawings (as amended), therefore each layer does not need to be specifically identified in every claim.

As stated in MPEP § 2173.04, breadth of a claim is not to be equated with indefiniteness. Further, where Applicants have not otherwise indicated that they intend the invention to be of a

scope different from that defined in the claims, then the claims comply with 35 U.S.C. § 112, second paragraph. As stated in claims 1-5, both the preamble and body of the claims clearly set forth the scope of the intended invention. Also, claim 1 is a method claim, so there is no need to recite structure. Accordingly, Applicant respectfully requests the Examiner to withdraw the 35 U.S.C. § 112, second paragraph rejections.

Although Applicant submits that claims 1-5 are not indefinite, Applicant has amended claims 1-4 to clarify the language set forth. Such amendments do not narrow the scope of the claims, but merely redefine or rearrange what was already included and, therefore, does not subject the claims to prosecution history estoppel. See: *Turbocare Corp. v. General Electric Co.*, 60 USPQ.2d 1017 (Fed.Cir. August 29, 2001) (*Festo*[1] is not applicable to a claim wherein a limitation is only redefined without narrowing the claim.).

The Examiner has further rejected claims 1-5 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,585,309 to Mori et al. (hereinafter "Mori"). Applicant submits that claims 1-5 are not anticipated by Mori for the following reasons.

With respect to claim 1, the Examiner maintains that Mori discloses the claimed method of making a semiconductor laser. However, Applicant submits that claim 1 is not anticipated by Mori. For example, in claim 1, a pair of second grooves are etched to the right and left from a first groove along a specified layer. The second grooves are filled with a material having a

[1] *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 234 F.3d 558, 56 USPQ.2d 1865 (Fed.Cir. 2000) (*en banc*), vacated and remanded, 2002 U.S. LEXIS 3818, (May 28, 2002).

refractive index higher than that of the specified layer in which they are etched. Therefore, two portions are formed which have a high refractive index.

The Examiner maintains that the above configuration and method is shown in Mori Figures 7a-8c. However, as shown in Figure 8(a), the second grooves 56 are etched in a downward direction through multiple layers, specifically, layers 45, 44, and 43, stopping at layer 42 (col. 19, lines 23-51). They are not etched along one specified layer as recited in claim 1. Therefore, Applicant submits that the method of forming second grooves 56 of Mori does not teach or even remotely suggest the method of claim 1.

In addition, second grooves 56 of Mori, are filled entirely by growth of the p type InP layer 47, having a low refractive index (col. 19, lines 52-55; col. 20, lines 54-59). As shown in Figure 8(b) and 8(c), second grooves 56 are surrounded by multiple layers including layers made of p-type InP, n-type InP and InGaAsP (col. 19, lines 1-22). This configuration does not suggest a pair of grooves filled with a material having a higher refractive index than that of a single specified layer in which the grooves are formed. Therefore, Mori does not suggest or disclose forming a pair of grooves having the same configuration or properties as the claimed invention. Accordingly, Applicant submits that the method of claim 1 is not anticipated by the cited reference and respectfully requests the Examiner to withdraw the rejection.

With respect to claim 2, the Examiner maintains that Mori discloses a semiconductor laser having a similar configuration and structure as the laser recited in claim 2. However, Applicant submits that claim 2 is not anticipated by Mori.

As recited in claim 2, a first groove is formed to penetrate through at least some of a plurality of layers. A pair of second grooves extend from a first groove to predetermined positions along a specified layer. The second grooves are filled with a material having a refractive index higher than that of the specified layer in which they are formed. Therefore, two portions are formed which have a high refractive index.

The Examiner maintains that the two high refractive index portions described above are shown in Mori, Figures 7a-8c. However, as shown in Figure 8(a), the second grooves 56 are formed downward through multiple layers, specifically, layers 45, 44, and 43, stopping at layer 42 (col. 19, lines 23-51). They are not formed in one specified layer as recited in claim 2. In addition, second grooves 56 of Mori, are filled entirely by growth of the p type InP layer 47, having a low refractive index (col. 19, lines 52-55; col. 20, lines 54-59). As shown in Figure 8(b) and 8(c), second grooves 56 are surrounded by multiple layers including layers made of p-type InP, n-type InP and InGaAsP (col. 19, lines 1-22). This configuration does not suggest a pair of grooves filled with a material having a higher refractive index than that of a single specified layer in which the grooves are formed. Therefore, Mori does not suggest or disclose a pair of grooves having the same configuration or properties as the claimed invention. Accordingly, Applicant submits that the semiconductor laser of claim 2 is not anticipated by the cited reference and respectfully requests the Examiner to withdraw the rejection.

Since the semiconductor laser of claim 3 contains second grooves similar to the second grooves recited in claim 2, Applicant submits that claim 3 is not anticipated by the cited

reference for similar reasons. Accordingly, Applicant respectfully requests the Examiner to withdraw the rejection.

In addition, the Examiner maintains that Figure 47d of Mori, described in column 2, suggests claims 2 and 3. However, as shown in Figure 47d, the laser structure does not suggest two grooves which form two portions having a higher refractive index than the layer in which they are formed. Rather, Figure 47d seems to suggest a ridge structure, where neither layers 202 or 203 are formed in a specified layer extending from a first groove. Accordingly, Applicant submits that claims 2 and 3 are not anticipated by Mori, and respectfully requests the Examiner to withdraw the rejections.

The Examiner rejects claim 4 as being anticipated by Mori. Since the semiconductor laser of claim 4 contains second grooves similar to the second grooves recited in claim 2, Applicant submits that claim 4 is not anticipated by the cited reference for similar reasons. Accordingly, Applicant respectfully requests the Examiner to withdraw the rejection.

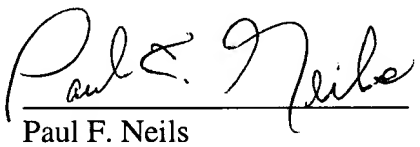
The Examiner also rejects claim 5 as being anticipated by Mori. However, Applicant submits that claim 5 is not anticipated by Mori. Specifically, as recited in the claim, the layer having material with a high refractive index and the material having a low refractive index are made of one refractive index distribution material. The refractive index distribution material gradually varies a refractive index in a lamination direction of both the materials. The Examiner contends that column 25, line 31 to column 31, line 37 suggests such a feature. However, Mori suggests p type InP layers and n type InP layers as being alternatingly laminated (col. 25, lines 31-32), or alternatingly grown on opposite sides of a mesa (col. 25, lines 51-52). Alternating

lamination of layers seems to suggest alternating different types of layers, one on top of the other. This is not similar to material which gradually varies a refractive index in a lamination direction (meaning across one layer). Also, since claim 5 is dependent upon claim 4, Applicant submits it is patentable at least by virtue of its dependency.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE ABSTRACT:

Please amend the abstract as follows:

[Disclosed is a]A semiconductor laser having an S-ARROW structure confining a basic lateral mode light between a pair of guide layers extending with a gap therebetween, which increases a precision of a shape of a guide portion, and is capable of stably emitting a light in the basic lateral mode. In the semiconductor laser having an activation layer and a plurality of layers in parallel with the activation layer, a first groove penetrating through at least some of the layers is formed, and a pair of second grooves extending to predetermined positions toward both sides from the first groove are formed in a specified layer among the layers through which the first groove penetrates. Furthermore, a material having a refractive index higher than that of the specified layer is filled up in the second grooves, thus forming two portions having a high refractive index.

IN THE CLAIMS:

The claims are amended as follows:

1. (Amended) A method of fabricating a semiconductor laser having a structure in which an equivalent refractive index of two portions disposed apart from each other is higher than that of adjacent portions to these portions in a direction perpendicular to a waveguide direction as well as in parallel with an activation layer, comprising the steps of:

forming said activation layer and a plurality of layers in parallel with said activation layer;

forming a first groove penetrating through at least some of said plurality of [said] layers;

selectively etching a specified layer among [said some]at least some of said plurality of layers through which said first groove penetrates, said etching extending from both sides of the first groove to a predetermined position in said specified layer [toward both sides from the first groove], thus forming a pair of second grooves; and

filling up said second grooves with a material having a refractive index higher than that of said specified layer, thus forming two portions having said high equivalent refractive index.

2. (Amended) A semiconductor laser, which has a structure in which an equivalent refractive index of two portions disposed apart from each other is higher than that of adjacent portions to these portions in a direction perpendicular to a waveguide direction as well as in parallel with an activation layer, comprising:

said activation layer and a plurality of layers in parallel with said activation layer,

wherein a first groove is formed penetrating through at leas t some of said plurality of [said] layers;

a pair of second grooves, extending from said first groove to predetermined positions [toward]from both sides of said first groove[s], are formed in a specified layer among said plurality of layers through which said first groove penetrates;

the second grooves are filled up with a material having a refractive index higher than that of the specified layer, and thus two portions having said high equivalent refractive index are formed; and

another layer is formed so as to contact with the material having said high refractive index remaining on a surface portion of the first groove.

3. (Amended) A semiconductor laser, which has a structure in which an equivalent refractive index of two portions disposed apart from each other is higher than that of adjacent portions to these portions in a direction perpendicular to a waveguide direction as well as in parallel with an activation layer, comprising:

said activation layer and a plurality of layers in parallel with said activation layer,

wherein a first groove is formed penetrating through at least some of said plurality of [said] layers;

a pair of second grooves, extending from said first groove to predetermined positions [toward]from both sides of said first groove, are formed in a specified layer among said plurality of layers through which said first groove penetrates;

the second grooves are filled up with a material having a refractive index higher than that of the specified layer, and thus two portions having said high equivalent refractive index are formed; and

another layer made of a different material from that having the high refractive index is formed so as to contact with a surface portion of the first groove.

4. (Amended) A semiconductor laser, which has a structure in which an equivalent refractive index of two portions disposed apart from each other is higher than that of adjacent portions to these portions in a direction perpendicular to a waveguide direction as well as in parallel with an activation layer, comprising:

said activation layer and a plurality of layers in parallel with said activation layer,

wherein a first groove is formed penetrating through at least some of said plurality of [said] layers to a specified layer;

a pair of second grooves, extending from the first groove to predetermined positions [toward]from both sides of the [second]first groove, are formed in a specified layer among said plurality of layers through which the first groove penetrates;

the second grooves are filled up with a material having a refractive index higher than that of the specified layer; and

layers made of a material having a refractive index are laminated on the material exposed in the first groove, this refractive index being lower than that of the material filled up in the second groove, and thus the two portions having said high equivalent refractive index are formed outside the material having the low refractive index.